



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/743,662	01/12/2001	Jorg Arnold	34691-206707	7370

826 7590 03/10/2004

ALSTON & BIRD LLP
BANK OF AMERICA PLAZA
101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000

EXAMINER

PERILLA, JASON M

ART UNIT	PAPER NUMBER
----------	--------------

2634

7

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/743,662

Applicant(s)

ARNOLD, JORG

Examiner

Jason M Perilla

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4.6</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 24-47 are pending in the instant application.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on January 12, 2001 (paper no. 4 in the file) was is in compliance with the provisions of 37 CFR 1.97.

Accordingly, the information disclosure statement is being considered by the examiner.

3. The information disclosure statement (IDS) submitted on January 2, 2003 (paper no. 6 in the file) was is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show any embodiment of the invention as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Regarding the drawings, the examiner notes that an embodiment of the invention should be included in the drawings. The current figures of record (figures 1-3) do not show the claimed embodiment of the invention. Specifically, the following claimed material should be shown in the corrected drawings:

- a. Following claim 24, the transmission method should be shown with the superposition of a transmission frequency and at least one additional frequency.

- b. Following claim 26, the filtering before superposition should be shown.
- c. Following claim 27, the amplification before superposition should be shown.
- d. Following claim 31, the detection method should be shown.

Claim Objections

5. Claims 24, 29, 30, 32, 35, and 40-43 are objected to because of the following informalities:

Regarding claim 28, the terms "level" and "adapted" in line 1 are not specific. The examiner suggests that the applicant makes use of more definite language such as *voltage* or *amplitude* and *increased* or *decreased*.

Regarding claim 29, the terms "level" and "adapted" in line 1 are not specific. The examiner suggests that the applicant makes use of more definite language such as *voltage* or *amplitude* and *increased* or *decreased*.

Regarding claims 24, 32, and 43, the term "predeterminable" is not defined in the English language, and it is not a term of art. The examiner suggests that the applicant makes use of other language. For the purpose of this examination, the term "predeterminable" of claims 24, 32, and 43 is understood as --that which could be determined--.

Appropriate correction is required.

6. Claim 35 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

Art Unit: 2634

required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Regarding claim 35, the limitation is added upon parent claim 24 of "at least one additional signal". However, claim 24 already states "at least one additional signal".

The examiner suggests that the applicant should correct the language to further limit parent claim 24 such as including, "a least two additional signals".

7. Claim 30 recites the limitation "the alternating voltage" in line 1. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 32 recites the limitation "the integrated signal power" in line 2. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 40 recites the limitation "both directly adjacent ... frequencies" in line 1. There is insufficient antecedent basis for this limitation of more than one additional frequency in the claim.

10. Claim 41 recites the limitation "the signal receiver" in line 2. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 42 recites the limitation "the ... signal receivers" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 112

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 25, 36-38, and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 25, the term "close" in line 2 renders the claim indefinite. The claim that the frequency of the additional signal is "close" to the frequency of the transmission signal is not specific. The use of the term "close" is not specific in reference to a pair of frequencies to one skilled in the art. Rather, it is open to interpretations. Hence, claim 25 is found to be indefinite.

Regarding claim 36, the term "directly adjacent" in line 3 renders the claim indefinite. The claim that the additional frequency is "directly adjacent" to the transmission frequency is not specific. Because a range of frequencies are a continuous (not quantized) set, one is unable to determine the value of adjacent frequency in comparison to any other frequency. Hence, claim 36 is found to be indefinite.

Regarding claim 37, the term "adjacent" in line 3 renders the claim indefinite. The claim that the additional frequency is selected outside the center between two "adjacent" transmission frequencies is not specific. Because a range of frequencies are a continuous (not quantized) set, one is unable to determine the value of adjacent frequency in comparison to any other frequency. Hence, claim 37 is found to be indefinite.

Regarding claim 38, the term "directly adjacent" in line 1 renders the claim indefinite. The claim that the additional frequency is "directly adjacent" to the

transmission frequency is not specific. Because a range of frequencies are a continuous (not quantized) set, one is unable to determine the value of adjacent frequency in comparison to any other frequency. Hence, claim 38 is found to be indefinite.

Regarding claim 40, the term "directly adjacent" in line 1 renders the claim indefinite. The claim that the additional frequency is "directly adjacent" to the transmission frequency is not specific. Because a range of frequencies are a continuous (not quantized) set, one is unable to determine the value of adjacent frequency in comparison to any other frequency. Hence, claim 40 is found to be indefinite.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

14. Claims 24, 25, 28-31, 35, 36, 38, 39-45, 47 are rejected under 35 U.S.C. 102(e) as being anticipated by Bohm (6246664).

Regarding claim 24, Bohm discloses by figure 1 a method of transmitting information by means of digital transmission signals (col. 1, lines 40-44) which have a predeterminable transmission frequency, comprising converting the transmission frequency in a signal converter by superposing a transmission signal (f_1) with at least one additional signal (f_2) of a predeterminable frequency on a component (ADD) with a linear characteristic curve, with the frequency of the additional signal being selected such that the superposition generates a beat pattern (col. 1, lines 56-60; col. 1, lines 40-60). The addition component (ADD) has a linear characteristic curve (addition is a linear operation).

Regarding claim 25, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the frequency of the additional signal is close to the transmission frequency of the transmission signal (col. 2, lines 48-50).

Regarding claim 27, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that transmission signals may be advantageously amplified before the superposition (col. 5, lines 40-45).

Regarding claim 28, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the level of the additional signal is adapted to the transmission signal (col. 2, line 65 – col. 3, line 11). Bohm describes that the level of the additional signal (fig. 1, ref. f_2) is adapted (corrected in phase angle) to the transmission signal (fig. 1, ref. f_1). The level of the additional signal is dependent upon the phase of the additional signal because the signal is a cosine function which varies in level with respect to phase. Bohm discloses that the phase angle of the additional

signal (f2) is fixed to zero degrees upon the turn-on of the control method SS2 (col. 3, lines 7-10; col. 3, line 15 – “SS1 and SS2 analogous operation”). Hence, the additional signal (f2) is adapted in level to the transmission signal (f1).

Regarding claim 29, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the level of the transmission signal is adapted to the additional signal (col. 2, line 65 – col. 3, line 11). Bohm describes that the level of the transmission signal (fig. 1, ref. f1) is adapted (corrected in phase angle) to the additional signal (fig. 1, ref. f2). The level of the transmission signal is dependent upon the phase of the transmission signal because the signal is a cosine function which varies in level with respect to phase. Bohm discloses that the phase angle of the transmission signal (f1) is fixed to zero degrees upon the turn-on of the control method SS1 (col. 3, lines 7-10; col. 3, line 15 – “SS1 and SS2 analogous operation”). Hence, the transmission signal (f1) is adapted in level to the additional signal (f2).

Regarding claim 30, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the alternating voltage of the beat pattern is amplified in the embodiment shown in figure 3 (AMP) (col. 4, line 4). Although the AMP of figure 3 is described in the specification of Bohm as an amplitude limiter, an amplifier is known in the art as something that provides amplification.

Regarding claim 31, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that, in the receiver, the detection of the transmission signals occurs by counting the signal extremes that result in the beat pattern (col. 9, lines 30-43). Bohm discloses, “if the detected amplitude is 1 and the detected carrier frequency

is f_2 , the bit combination 010 will be generated". Hence, the signal extreme or detected amplitude is "counted" or included in the demodulation.

Regarding claim 35, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses by figure 1 that at least one additional signal (f_2) is associated to each transmission frequency (f_1).

Regarding claim 36, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the frequency of the additional signal is selected between the transmission frequency and a directly adjacent, further transmission frequency (col. 2, lines 47-50).

Regarding claim 38, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that a directly adjacent transmission frequency is selected as the frequency of the additional signal.

Regarding claim 39, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses by the embodiment of figure 8 that two symmetrically present, equidistant transmission frequencies (f_2 and f_3) are selected as the frequency of the additional signal (col. 6, lines 25-27).

Regarding claim 40, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses by the embodiment of figure 8 that both directly adjacent, equidistant transmission frequencies (f_2 , and f_3) are selected as the frequency of the additional signal (col. 6, lines 25-27).

Regarding claim 41, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the signal transmitter (fig. 1) and the signal receiver (fig.

10) are synchronized (col. 4, lines 11-18; col. 11, lines 1-3). It is inherent that the transmitter and the receiver are synchronized as broadly as claimed because they would need to be synchronized (in tune with, in time with, using the same transmission/reception signal) with each other for the reception of the transmitted signal. Hence, they would need to be synchronized to provide utility to the system.

Regarding claim 42, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that a radio clock is associated to the signal transmitters (fig. 3 refs. "CLK"; col. 4, lines 11-18) and signal receivers (fig. 11, ref "RCLK"; col. 9, lines 10-15). Bohm discloses that a radio clock is associated to the transmitters (col. 4, lines 11-18) and also associated with the receiver (col. 9, lines 10-15).

Regarding claim 43, Bohm discloses the limitations according to claim 24 as applied above. Further, it is inherent that the signal transmitters and the signal receivers transmit and receive according to a predeterminable timing sequence. In other words, it is inherent that the transmitters and the receivers transmit and receive according to a sequence that could be determined.

Regarding claim 44, Bohm discloses the limitations of claim 43 as applied above. Further, Bohm discloses that the timing sequence is controlled via a radio clock (fig. 3, ref. "CLK"; col. 4, lines 11-18)(fig. 11, ref. "RCLK"; col. 9, lines 10-15).

Regarding claim 45, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the transmission frequency is transmitted and received with a right-hand and a left-hand polarization alternating with each other (col. 7, lines 45-55; col. 8, lines 1-10). Bohm discloses, "For example, phases of 0, 90, 180 degrees

are assigned to the bit combinations 010, 101, 111. Thus, if the bit combination 101 occurs, in addition to the carrier frequency f_2 , the subsequent synchronizing signal with the carrier frequency f_1 will be transmitted with the initial phase of 90 degrees. The nonzero phase is detected at the receiving end and can thus be assigned to the bit combination 101." Hence, in the above embodiment of Bohm, frequencies (data bits) may be alternatively transmitted with right-hand (0 phase shift) and left-hand (90 degree phase shift) polarization.

Regarding claim 47, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the digital transmission signals are radio signals (col. 10, lines 10-14).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 32-34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm.

Regarding claim 32, Bohm discloses the limitations of claim 24 as applied above. Further, Bohm discloses that the amplitude of the received signal is used during demodulation (col. 6, lines 28-34). Bohm discloses that the amplitude is combined with the frequency and used for the symbol selection or demodulation. The amplitude over a period of time is the integrated signal power. Because Bohm discloses that the

amplitude is utilized for demodulation (it is inherent that time and amplitude is included), it would have been obvious to one of ordinary skill in the art that detection of the transmission signals could occur by comparing the integrated signal power over time intervals of the beat pattern. The use of the term "predeterminable" in claim 32 adds no specific limitation to the claim.

Regarding claim 33, Bohm discloses the limitations of claim 33 as applied above. Further, it is inherent that a time interval is selected during demodulation as broadly as claimed.

Regarding claim 34, Bohm discloses the limitations of claim 32 as applied above. Further, it is obvious that the detection of the transmission signals occurs by comparing the signals throughout the entire time interval of transmission (col. 8, lines 40-50) including the chronological midrange as well as the edge range of the beat pattern because the entire signal is used for demodulation.

17. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm in view of Bies (3566314).

Regarding claim 26, Bohm discloses the limitations of claim 24 as applied above. However, Bohm does not explicitly state that the transmission signals are pre-filtered before the superposition. Filters are notoriously known in the art, and one skilled in the art is certain to understand the application of a filter. Bohm discloses that the frequencies (fig. 1, refs. f1 and f2) are very close in value (col. 2, lines 47-50). Although Bohm does not disclose filtering of the transmission signals before superposition, Bies does teach a band-pass filter suitable for filtering the transmission signals before

superposition (fig. 3, fig. 7). Therefore, it would have been obvious to one of ordinary skill in the art at the time which the invention was made to utilize a band-pass filter as taught by Bies in the transmission method of Bohm because the transmission signals could be precisely limited to exactly the desired frequencies before superposition.

Because the receiver depends of the identification of the particular transmission frequencies, it would be advantageous to keep them as precise as possible.

18. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohm in view of Pophillat (5448392).

Regarding claim 46, Bohm discloses the limitations of claim 24 as applied above. Bohm does not disclose that the component is an electro-optical component. However, Pophillat teaches an electro-optical component that can be used to transmit electrical signals over an optical transmission media (abstract). The electro-optical component is shown in figure 5 as reference 5. The use of optical transmission of signals is well known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to use an electro-optical component as taught by Pophillat in the transmission method of Bohm because the transmission signals could subsequently be transmitted over an optical transmission channel.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references not relied upon above are cited to further show the state of the art.

U.S. Pat. No. 5504783 to Tomisato et al; Frequency diversity transmitter.

U.S. Pat. No. 5650996 to Bode et al; Combining data signals on a channel.

U.S. Pat. No. 5323255 to Sierens et al; Optical transmission.

U.S. Pat. No. 5384651 to Van de Voorde et al; Optical transmission.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J M Perilla

Jason M Perilla
February 19, 2004

[Signature]
STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

jmp